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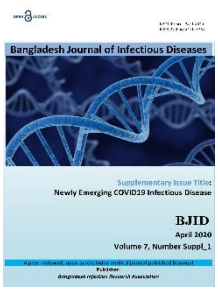

Novel Coronavirus: A New Challenge for Medical Scientist?

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The Severe Acute Respiratory Syndrome (SARS) forge pandemic, the first nightmare of the 21st century, humans have a deep history of battling viruses. Horribly, at the beginning of this New Year, there is another active outbreak of a novel coronavirus (2019-nCoV) in China, originated from the Wuhan region. Coronaviruses are not new, they are from the subfamily Coronavirinae in the family Coronaviridae, however, the human coronaviruses, was first characterized in the 1960s, interestingly, Severe Acute Respiratory Syndrome (SARS) is also caused by a member of the coronavirus family[1]. However, "2019-nCoV"- the novel coronavirus is a new strain that has not been previously identified in humans. About 11 million people live in the Wuhan city which is considered as a major transportation hub, however, initially in the December 2019, number of pneumonia cases due to unknown etiology has been identified in the city and most of the patients have a history of visiting wild animal market or local fish market and finally, Dr. Jianguo Xu, an academician from the Chinese Academy of Engineering announced that it was a new-type coronavirus, and the name was given by the World Health Organization (WHO) as the 2019-new coronavirus (2019-nCoV)[2]. However, still, it remains unrevealed which animals in the Wuhan seafood market are linked to the outbreak. Chinese scientists did excellent work, they have already identified the genetic sequence of this novel coronavirus, and it has at least 70% similarities with deadly SARS-CoV[3]. According to WHO, 20 January 2020, 282 confirmed cases of 2019-nCoV have been identified globally and it's alarming that reports are not only coming from China but also different parts of the world, 6 deaths occur due to this new deadly virus[4]. Moreover, Chinese people are going to celebrate their Lunar New Year on 25 January, thousands of people visited China to participate in the festival, therefore, this outbreak may turn into a global crisis[5].

Often bats are the thought to be the primary source of coronaviruses, however, in most cases, they are not able to pass the virus directly to humans. For example, SARS coronavirus originated from wild animals, and later it spread either directly to humans or to animals which later on purchased by humans at markets[6]. Another coronavirus Middle East respiratory syndrome coronavirus (MERS-CoV) that came from camels[7]. Wei et al[8] hypothesized that snakes might be the source of this new 2019-nCoV and snakes believed to be sold at the local Wuhan market. Yet, it is a doubtful question, the source of this novel 2019-nCoV? So, it is really important to identify the source of this new coronavirus as soon as possible. According to the Chinese health authorities, this new coronavirus might be transmitted from human to human. However, there is no clear evidence that like many other coronaviruses this new strain is transmitted by coughing and sneezing. Minimizing the transmission of such infectious diseases is the key to prevent an outbreak and the basic level of hygiene could be a good effective measure in any situation. Moreover,

epidemiologists are trying to calculate, how infectious the new virus is and Christian Althaus and Julien Riou, from University of Bern in Switzerland, revealed that the new virus's infectivity is between 1.4 and 3.8[9]. In 1882, Robert Koch revealed his work with the tubercle bacillus, his famous postulates changed the rationale of infectious disease. According to the Koch's postulates, the microorganism or other pathogens must be present in all cases of the disease, the pathogen can be isolated from the diseased host and grown in pure culture, the pathogen from the pure culture must cause the disease when inoculated into a healthy, susceptible laboratory animal and the pathogen must be re-isolated from the new host and shown to be the same as the originally inoculated pathogen[10]. In this case, 2019-nCoV has been successfully isolated from the patient and cultured in host cells[11]. Therefore, it has strongly met few criteria of Koch's Postulates theory.

However, still, there are no animal models of coronavirus thus it becomes difficult to testify the ability of 2019-nCoV in generating pneumonia in a similar species. Therefore, it doesn't fulfill the criteria of re-isolation and specific immune response. Koch's postulates played a pivotal role in Microbiology, still it has limitations. Here, MERS coronavirus could only infect human primates and couldn't infect the rodent cells without manipulations[12], on the other hand, SARS-CoV can easily infect laboratory mice[13]. Newly developed sequencing techniques and different molecular detection techniques are opening new horizons in microbial discovery[14]. In this case, complete genome analysis has been done, moreover, the phylogenetic analysis suggested that 2019-nCoV belongs to the genus beta coronavirus[15]. A number of researches are still going on, however, the infectious level of the 2019-nCoV for different species and different cell types are still unveiled. "Can this novel coronavirus meet Koch's postulates criteria"? Only future research can give us the answers. During this early stage of this novel 2019-nCoVoutbreak, tension is generating all over the world, so many folk tales spreading through mobile phones, social media. Theses spread kinds of rumors exacerbated social panic. Previously, SARS had a great impact on tourism and its related industries, tourist's movement in China and many counties declined. However, the global macroeconomic impact of SARS was estimated at USD 30 to 100 billion[16]. Furthermore, the financial markets across Asia and China stock market felt after the outbreak of the coronavirus. In this situation, the Chinese government and world health authorities should provide open access to information for the general population.

Currently, there are no effective antiviral drugs for this new coronavirusand the initial efforts focused on the use of currently available drugs. The development of antiviral drugs is a very complex and time-consumingprocess. A number of people died due to SARS, MERS, Ebola, Dengue in current years. It's time to invest more in the development of newer antiviral drugs.

Viruses spread irrespective of border or nation; much more international scientific collaboration is needed in this acute emergency. Policy makers, public health workers, doctors, virologists, social workers should come together to combat this new challenge.

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